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(54) Retractable bed structure

(57) The retractable bed structure according to the invention comprises an essentially horizontal suspended platform (11), which supports a frame with slats, bedsprings or the like (11.3), on which an actual bed can be placed with mattress, sheets and blankets, on which one or more persons can lie, and in that said suspended platform (11) is supported movable by means of lifting and lowering means (12, 13.1, 13.2, 14, 15.1, 15.2, 16, 17, 18, 18.1, 19) selectively controlled by a user, so as to arrange the platform either in a lowered position in proximity of the floor of a room or the like, in which it can be used as a bed, or in a lifted position, in proximity of a ceiling or the like (S), in which the platform does not obstruct the movement of persons in the room or the like.

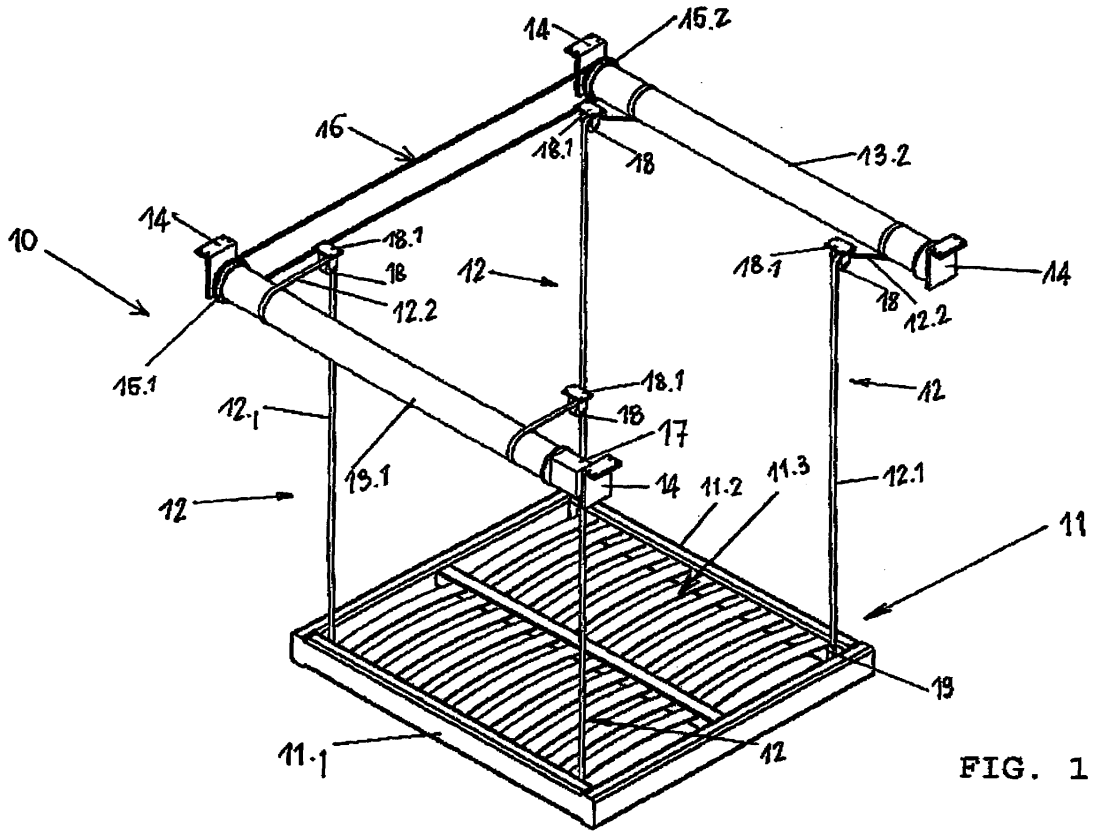

FIG. 1

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Description

[0001] The present invention relates to a retractable bed structure.

[0002] Retractable beds mounted on wheels which are positioned, when not in use, under other furniture or the like are known. Retractable beds that fold up around a horizontal axis and can, for example, be placed inside a wardrobe, i.e. a fitted wardrobe when not in use are also known. A known retractable bed structure of this type therefore requires the presence in the room in which it is located either of another piece of furniture or of a wall compartment designed to receive it. This results in the drawback of either limited space in the room or of the necessary presence of a suitable compartment in the wall.

[0003] Starting from the notion of this drawback, the present invention intends to solve it.

[0004] An object of the present invention is to provide a retractable bed structure which does not require the presence in the room in which it is located of any other furniture or wall compartment in which it is placed when not in use.

[0005] Another object of the present invention is to provide a retractable bed structure, which is constructionally and functionally simple and safe, and easy to install.

[0006] In view of these objects, the present invention relates to a retractable bed structure, the essential characteristic of which forms the subject of claim 1.

[0007] Further advantageous characteristic are described in the dependent claims.

[0008] The aforesaid claims are intended as fully integrated herein.

[0009] The present invention will be more apparent from the detailed description below with reference to the accompanying drawing, provided purely by way of example, wherein:

- Fig. 1 is a perspective top view of the retractable bed structure according to an example of embodiment of the invention, in the position of use thereof, but wherein - to simplify illustration - securing to the ceiling thereof is not shown;
- Fig. 2 is a view similar to that of Fig. 1, but which also shows a false ceiling forming the compartment to conceal said retractable bed structure;
- Figs. 3 and 4 are respectively front and side elevations of the retractable bed structure according to Fig. 2, also showing a ceiling (in section) for securing of the structure;
- Fig. 5 is a view similar to that of Fig. 2, but showing the bed structure not in use, housed completely retracted in the concealing compartment;
- Fig. 6 is a perspective bottom view of said retractable bed structure, in the position not in use of Fig. 5;
- Figs. 7 and 8 are respectively front and side elevation views of the retractable bed structure according to Fig. 5, but also showing a ceiling (in section) for securing of said structure.

[0010] In the drawing, the number 10 (Fig. 1) indicates the retractable bed structure according to the present invention as a whole.

[0011] Said retractable bed structure 10 comprises a suspended platform 11, essentially horizontal and rectangular. Said platform 11 is supported and can be lifted and lowered vertically by means of four ropes 12, substantially equal in length and secured with a respective end to the platform 11 (one for each corner thereof). Two of said ropes 12 are arranged along a first side 11.1 of the platform 11 and are wound, with the other end thereof, around a first shaft 13.1 with axis substantially horizontal and parallel to said side 11.1 of the platform, while the other two ropes 12 are arranged along the opposite side 11.2 of the platform 11 and are wound, with the other end thereof, around a second shaft 13.2 with axis substantially horizontal and parallel to said opposite side 11.2 of said platform 11. Said two shafts 13.1, 13.2, which are mutually parallel and arranged outside the platform 11, on opposite sides thereof, are secured to the ceiling (S) of a room (Figs. 3, 4, 7, 8) by means of respective end brackets 14. Said shafts 13.1, 13.2 2 are for example tubular, cylindrical or prismatic. Said first shaft 13.1 carries at one end a coaxial and integral toothed pulley 15.1, while an identical pulley 15.2 is secured coaxial to the corresponding end of said second shaft 13.2. A corresponding toothed belt 16 is wound between said pulleys 15.1, 15.2. An electric gear motor 17 is kinematically connected to the end of the first shaft 13.1 opposite the pulley 15.1. the output shaft of which (not shown in the drawing) is coaxial with the shaft 13.1. Said electric gear motor 17 is electrically connected in an electrical / electronic supply and control circuit, known per se and not shown, which allows the user of the retractable bed structure 10 to control rotation and stopping thereof, for example using a remote control. Said gear motor 17 with the relative electrical / electronic circuit is, for example, similar to that used in the roller blinds of windows and the like, the functions of which can be programmed by the user.

[0012] Each rope 12 has a first substantially vertical branch 12.2, extending from the platform 11 and guided by means of a corresponding idle roller 18 secured to said ceiling S, with axis parallel to the axis of the shafts 13.1, 13.2, by means of corresponding supporting brackets 18.1, arranged in a respective corner area of the platform 11. Said vertical branch 12.1 of each rope 12 is connected to the platform 11 by means of a corresponding adjustable clamp 19, to ensure planarity of the installed platform. Moreover, each rope 12 has a second branch 12.2, extending from the respective idle roller 18 to the corresponding shaft 13.1, 13.2, on which the branch 12.2 is wound with the free end thereof, from above in the case of the first shaft 13.1 and from below in the case of the second shaft 13.2. operation

[0013] when the ropes 12 are unwound uniformly from the respective shafts 13.1, 13.2, until the suspended plat-

form 11, is positioned, for example, in proximity of the floor of a room, as shown in Fig. 1 (in which the floor is not shown) the bed structure 10 is in the using position thereof. The platform 11 supports a framework with slats (or with bedsprings) 11.3, on which an actual bed can be placed with mattress, sheets and blankets (not shown), on which one or more persons can lie.

[0014] Starting from this position, rotating the gear motor 17 so that the pairs of ropes 12 are wound simultaneously on the respective shafts 13.1, 13.2, also due to the kinematic chain 15.1 - 16 - 15.2, the suspended platform 11 is raised towards the ceiling S of the room, until it is position in proximity of the shafts. The platform 11 is thus arranged in a position not in use, in which it does obstruct the movement of the persons in the rooms or the like. This raised position (just as the lowered using position) can be identified automatically by means of the electrical / electronic limit stop means (known per se and not shown) inserted in said electrical / electronic supply and control circuit, or through programming of the functions of the gear motor 17 or, more simply, it can be identified manually through the control or remote control means operated by the user.

[0015] It can be noted that in proximity of the ceiling S a false ceiling S1 is arranged (Figs. 3, 4, 7, 8) provided with an opening A corresponding substantially to the suspended platform 11, while the other parts of the bed structure 10 are arranged in a compartment V existing between ceiling S and false ceiling S1. In this manner, in said position not in use, the platform 11 is positioned completely retracted, together with the other elements of the bed (slatted frame, mattress, blankets, etc.) in said compartment V. It can be noted that the bottom of the suspended platform 11 is provided with a panel 11.4 of material similar to that of the false ceiling S1 and that, in the position not in use of the platform, it is aligned with this false ceiling, ensuring that the bed structure 10 is completely retracted from view.

[0016] As is apparent from the above, the present invention allows the objects set forth in the preamble to be achieved in a simple, effective and safe manner.

Claims

1. A retractable bed structure, **characterized in that** it comprises a suspended platform (11), essentially horizontal, which supports a frame with slats, bedsprings or the like (11.3), on which an actual bed can be placed, with mattress, sheets and blankets, on which one or more persons can lie, and **in that** said suspended platform (11) is supported movable by means of lifting and lowering means (12, 13.1, 13.2, 14, 15.1, 15.2, 16, 17, 18, 18.1, 19) selectively controlled by a user, so as to arrange the platform either in a lowered position in proximity of the floor of a room or the like, in which it can be used as a bed, or in a raised position, in proximity of a ceiling or the like (S), in which the platform does not obstruct the movement of persons in the room or the like.

2. A retractable bed structure according to claim 1, **characterized in that** said suspended platform (11), in said raised position, is arranged retracted, together with the elements of the bed carried thereby, through an opening (A) of a false ceiling or the like (S1), in a compartment (V) existing between said false ceiling or the like (S1) and said ceiling or the like (S).

3. A retractable bed structure according to claim 1 or 2, **characterized in that** said raising and lowering means of the suspended platform (11) comprise a pair of shafts with horizontal axis (13.1, 13.2) secured to the ceiling (S) of a room or the like, **in that** a first shaft (13.1) carries a coaxial and integral pulley or the like (15.1), while an identical pulley or the like (15.2) is secured coaxial to the second of said shafts (13.2) and a corresponding belt (16) is wound between said pulleys (15.1, 15.2), and **in that** an electric gear motor (17) is kinematically connected to said first shaft (13.1), electrically connected in an electrical / electronic supply and control circuit, which allows the user of said retractable bed structure (10) to control rotation thereof, to selectively control lifting or lowering of said platform (11).

4. A retractable bed structure according to claim 3, **characterized in that** said shafts (13.1, 13. 2) are arranged substantially mutually parallel and outside said platform (11), on opposite sides of the platform, and **in that** said platform (11) is supported and can be lifted and lowered vertically by means of four ropes (12), substantially of the same length and secured with one respective end to the platform (one for each corner area or similar thereof): two of said ropes (12) are arranged along a first side (11.1) of the platform (11) and are wound, with the other end thereof, around said first shaft (13.1), while the other two ropes (12) are arranged along the opposite side (11.2) of the platform (11) and are wound, with the other end thereof, around said second shaft (13.2).

5. A retractable bed structure according to claim 4, **characterized in that** each rope (12) has a first substantially vertical branch (12.1), extending from the platform (11) and guided through a corresponding idle roller (18) secured to the ceiling (S), with axis substantially parallel to the axis of said shafts (13.1, 13.2), in a respective corner area or similar of the platform (11), while each rope (12) has a second branch (12.2), extending from the respective idle roller (18) to a corresponding shaft (13.1, 13.2), on which the branch (12.2) is wound with the end thereof, from above in the case of the first shaft (13.1) and from below in the case of the second shaft (13.2), or

vice versa.

6. A retractable bed structure according to claim 5, **characterized in that** said vertical branch (12.1) of each rope (12) is connected to said platform (11) by means of a corresponding adjustable clamp (19), to ensure the planarity of said installed platform.

7. A retractable bed structure according to one or more of the preceding claims, **characterized in that** said gear motor (17) with relative electrical / electronic circuit is of a type similar to that used in the roller blinds of windows and the like, the functions of which can be programmed by the user.

8. A retractable bed structure according to one or more of the preceding claims, **characterized in that** the lifted position not in use and/or the lowered position in use of the suspended platform (11) is automatically identified by means of electrical / electronic limit stop means (fitted in said electrical / electronic supply and control circuit), or by means of programming of the functions of the gear motor (17) with relative circuit, or is identified manually by control or remote control means operated by the user.

9. A retractable bed structure according to claim 2, **characterized in that** the lower part of said suspended platform (11) is provided with a panel (11.4) of material similar to that of the false ceiling (51) and **in that**, in the position not in use of this platform, it is aligned with this false ceiling, ensuring that the bed structure (10) is completely retracted from view.

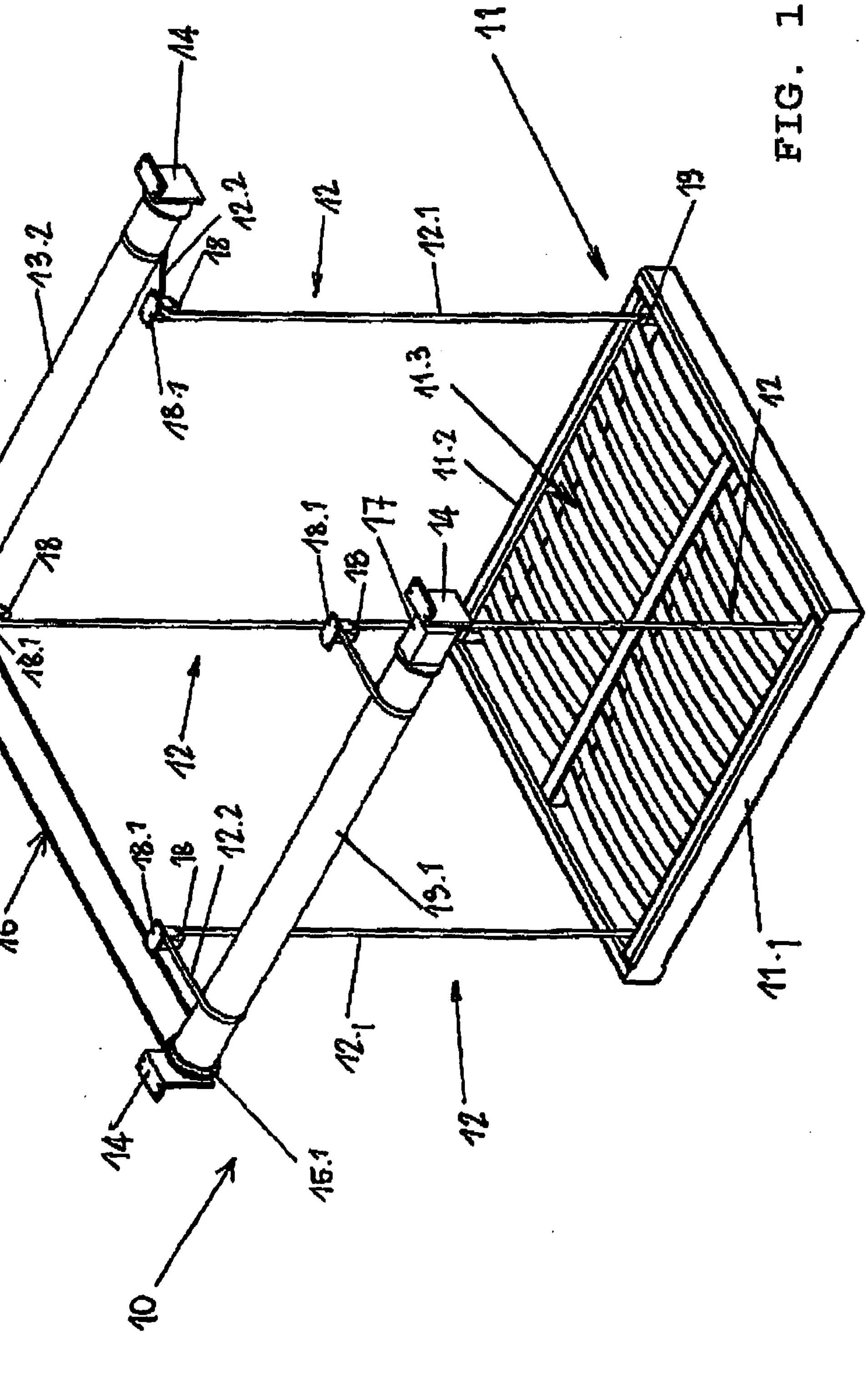

FIG. 1

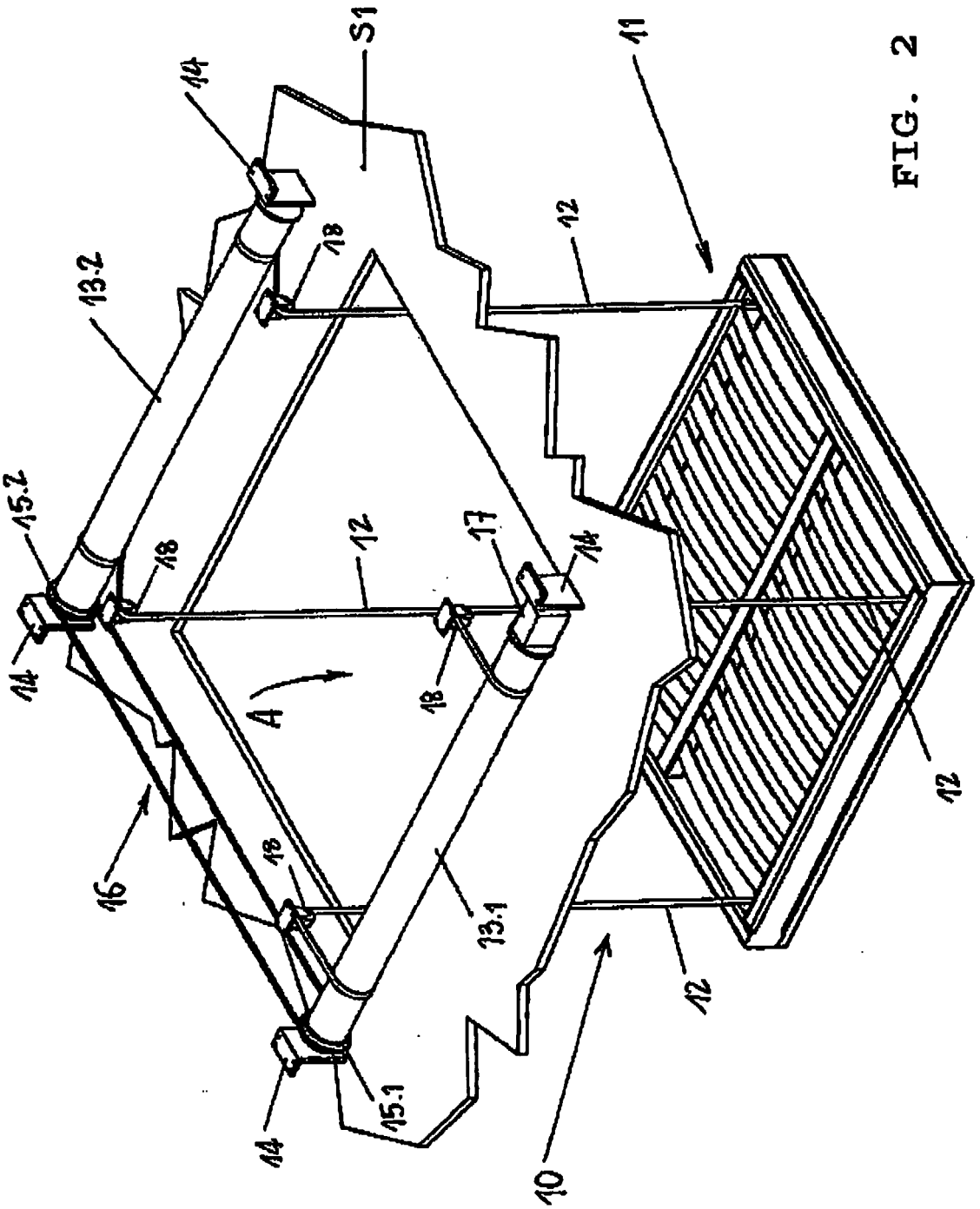

FIG. 2

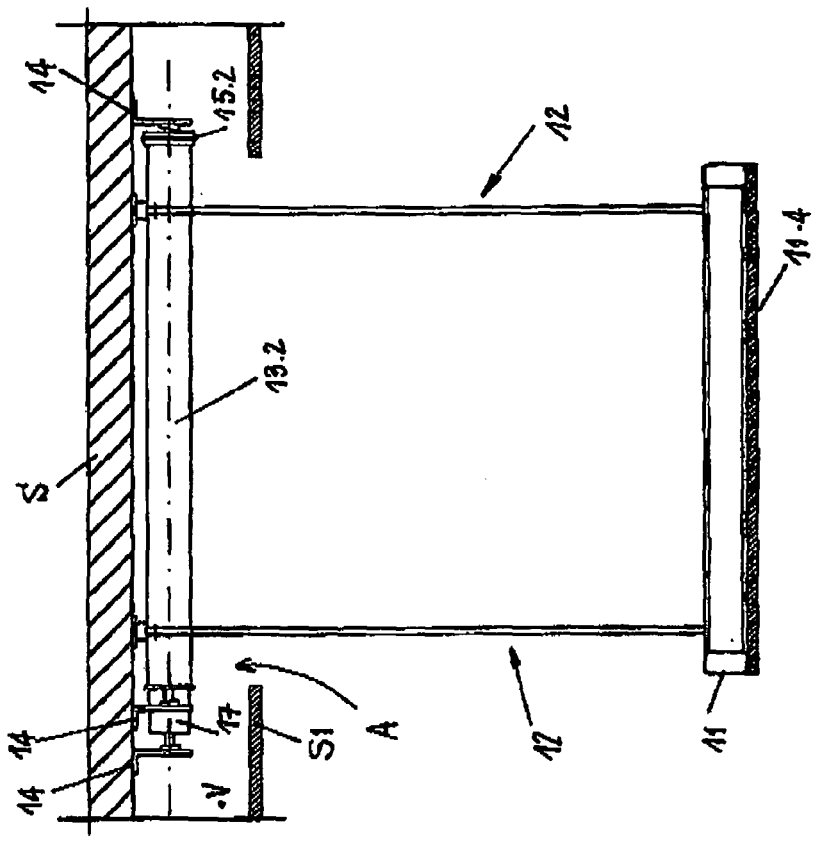
14
15.2
12
11.4
13.2
S
14
17
S1
A
12
11
14
V

FIG. 4

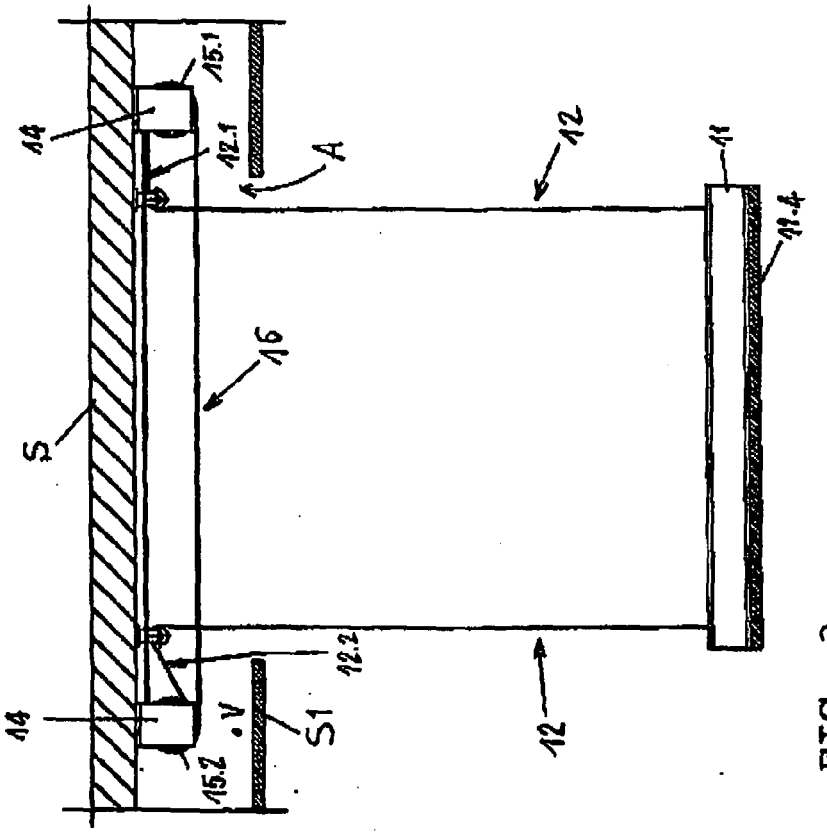
14
15.1
12.1
A
12
11
11.4
16
S
12.2
14
S1
V
15.2
12

FIG. 3

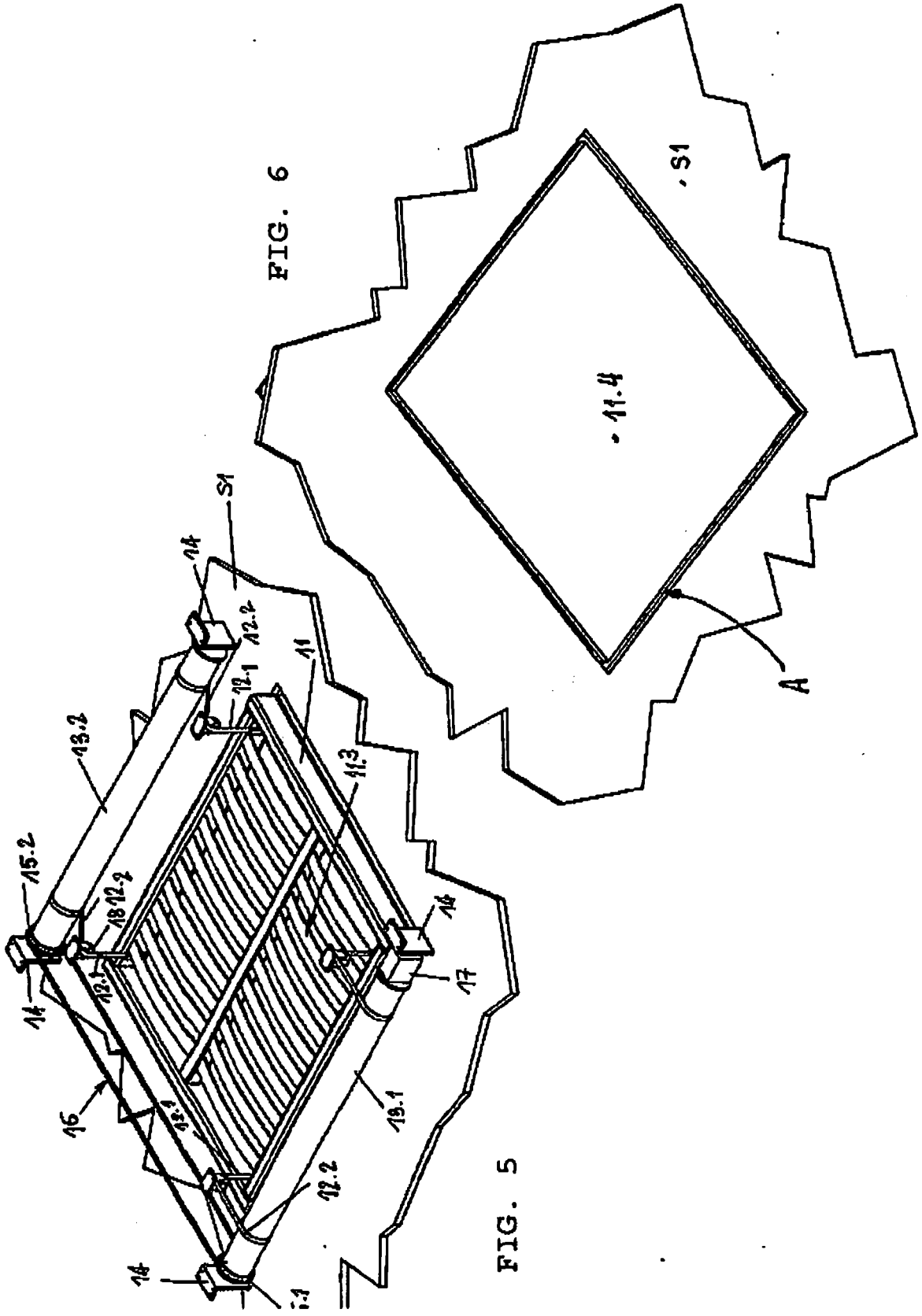

FIG. 6

FIG. 5

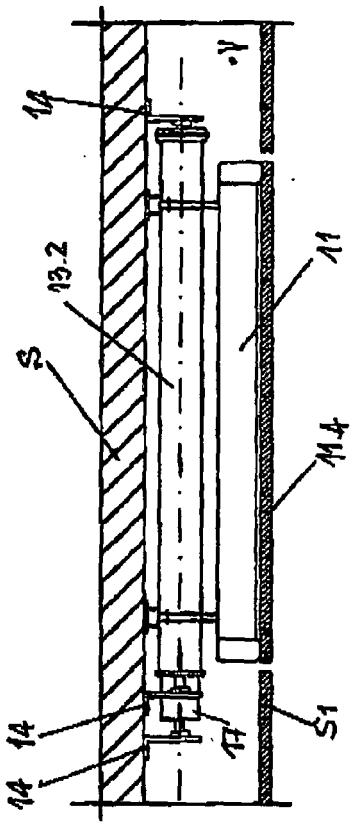
14
13.2
S
11
11.4
14
14
17
S1

FIG. 8

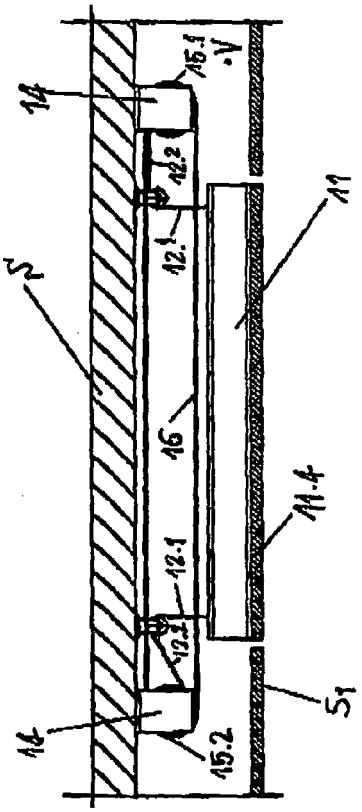
15.1
14
12.2
12.1
11
S'
16
11.4
12.1
12.2
S1
14
15.2

FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 09 00 6740

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	CN 2 724 524 Y (SONG HUIJUN [CN]) 14 September 2005 (2005-09-14) * figures 1,2 *	1-5,7-9 6	INV. A47C17/84 E04B9/00
X Y	US 2 968 048 A (GUY ROBERGE) 17 January 1961 (1961-01-17) * column 2, line 20 - line 32; figures 6-8 *	1-2,7-9 6	
X	US 7 350 850 B2 (RASMUSSEN C M [US] RASMUSSEN C MARTIN [US]) 1 April 2008 (2008-04-01) * column 105, line 35 - line 55; figures 176-179 *	1-5,7-9	
X	FR 2 610 496 A2 (AVRIL JOEL [FR]) 12 August 1988 (1988-08-12) * the whole document *	1-5,7-9	
X	DE 29 27 166 A1 (KLEINE HERMANN J) 8 January 1981 (1981-01-08) * page 10, line 10 - page 15, line 14; figures 1-7 *	1-5,7-9	TECHNICAL FIELDS SEARCHED (IPC) A47C E04B
X	FR 2 826 844 A1 (HARNETIAUX JEAN PIERRE [FR]) 10 January 2003 (2003-01-10) * the whole document *	1-3,7-9	
X	US 67494 A (D. BURNETT) 6 August 1867 (1867-08-06) * the whole document *	1-2,9	
X	US 1 065 740 A (T. H. SORLIEN) 24 June 1913 (1913-06-24) * the whole document *	1-2,9	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	17 September 2009	Kus, Slawomir

CATEGORY OF CITED DOCUMENTS

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17-09-2009

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 2724524 Y	14-09-2005	NONE	
US 2968048 A	17-01-1961	NONE	
US 7350850 B2	01-04-2008	US 2008238119 A1 US 2006181110 A1 US 2006290159 A1	02-10-2008 17-08-2006 28-12-2006
FR 2610496 A2	12-08-1988	NONE	
DE 2927166 A1	08-01-1981	NONE	
FR 2826844 A1	10-01-2003	NONE	
US 67494 A		NONE	
US 1065740 A		NONE	

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